

## VDRL TESTS IN REPRESENTATIVE COMMUNITIES OF GUYANESE ADULTS\*

BY

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The proportion of West Indian populations reacting to serological tests for treponemal disease is high. Ashcroft, Miall, Standard, and Urquhart (1967) found that of adult populations in Jamaica 40 per cent. of rural dwellers and 38 per cent. of suburban dwellers gave reactive or weakly reactive results in the Venereal Disease Research Laboratory (VDRL) test, and similar results were obtained with the Reiter protein complement-fixation (RPCF) test. Part of this high prevalence of reactivity was due to previous infection with yaws in childhood; only 16 per cent. of those born and brought up in the suburban community, where yaws had never been transmitted, were reactive or weakly reactive. Nevertheless 16 per cent. is a very high proportion compared with that found in North American and European communities and may be the result of the pattern of West Indian culture in which instability in sexual and marital relationships is common (Blake, 1961). The situation in Guyana, a recently independent nation in South America formerly known as British Guiana, is of interest in this respect. Not only has yaws been absent from most of the country for many years but the majority of the population belong to two distinct ethnic groups. Those of African origin have a cultural background similar to that in Jamaica and other parts of the West Indies; they are mostly descendants of people from West Africa brought to Guyana by the slave trade, which was terminated in 1807. Those of East Indian origin, who now comprise about half the population, are descendants of indentured labourers, mostly from the central Ganges valley of India, who immigrated to Guyana between 1845 and 1917. The East

Indians live in a patrifocal rather than a matrifocal society, in which marital ties are more stable; people of this race might thus be expected to have fewer sexual contacts. This paper reports the prevalence of serological reactivity to the VDRL test in adults of African and East Indian origin living side by side in a typical rural area of Guyana.

### Techniques

A private census was taken of all persons aged 35 to 54 years living in two adjacent communities, Annandale and Buxton, on the East Coast of the county of Demerara about 12 miles from Georgetown, the capital. Those of Indian origin live in Annandale and those of African origin in Buxton, a racial division which was accentuated by civil disturbances in 1964. Many of the inhabitants of Annandale are cane cutters or otherwise concerned in the sugar industry. In Buxton the occupations are more varied; in addition to those working in the sugar industry, some cultivate small plots of land, some work in the city of Georgetown, and others are labourers in the bauxite mines in the interior, returning to the coast at Buxton at weekends or at holiday periods.

All persons on the census were asked to attend Lusignan Hospital which serves the local employees of the Guyana Sugar Producers' Association and their families. Clinical examination, anthropometric, cardiovascular, and respiratory investigations including chest radiography, were carried out. Venous blood was taken from the arm and, after centrifuging, the sera were stored in a frozen state before being flown to Jamaica preserved with dry ice. The proportions of the population who were tested (the response rates) are shown in Table I.

Sera were examined at the Department of Microbiology, University of the West Indies, by the VDRL test, which was carried out quantitatively in tubes. Subjects with strongly reactive sera were advised to attend a clinic or to visit their private physician.

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### Results

The number of subjects with reactive and weakly reactive VDRL test results at various dilutions is shown in Table I; 87 (11.2 per cent.) of the total of 774 sera examined were weakly reactive and 53 (6.9 per cent.) reactive at various dilutions. Disregarding weakly reactive results, which are preferably confirmed by other tests, the sera of thirteen (8.4 per cent.) African men, eleven (5.5 per cent.) East Indian men, twenty (9.4 per cent.) African women, and eight (3.9 per cent.) East Indian women were reactive.

### Discussion

In some areas of the West Indies, of which Guyana is historically, culturally, and economically, if not geographically, a part, a positive result to a serological test for treponemal disease may frequently be the consequence of infection with yaws rather than syphilis. Yaws used to be of common occurrence in parts of Jamaica, Trinidad, and the Windward Islands, but was less frequent in the Leeward Islands and has been absent from Barbados for many years. Yaws is at present much less prevalent everywhere owing to better living standards, the efficacy and simplicity of penicillin treatment, and in some islands to mass eradication campaigns, but small foci of infection continue to exist. These have been described in Jamaica by Gentle (1965), Gourlay and Marsh (1965), and Ashcroft, Urquhart, and Gentle (1967), and in St. Lucia by Lees and de Bruin (1963). Although

yaws does not now constitute a major public health problem, evidence of previous infection can still be vexing, because a persisting reactive result to a test for treponemal disease may give rise to inconvenience and distress in such matters as emigration and employment.

During the days of slavery persons infected with yaws were continually being brought into Guyana from Africa, and almost every estate had its "yaws house" where those suspected of infection were isolated. After emancipation this form of control was impractical but, contrary to experience in the rest of the West Indies (Milroy, 1873; Nicholls, 1894), the prevalence of yaws diminished in Guyana. By the end of the 19th century, according to Wallbridge and Daniels (1895), it was found only in the isolated Leguan and Wakenaam Islands situated in the estuary of the Essequibo River and in a few remote inland localities, where it remained at a low level of endemicity until recently. The relative scarcity of yaws in Guyana was curious. The climate is hot and humid, the rainfall is high, and much of the population lived in overcrowded and insanitary housing—all conditions which favour the transmission of the disease. A characteristic feature of Guyana is that the inhabited coast lands are intersected with canals and trenches in which the children presumably used to swim and play just as they do today; it is possible that this frequent ablation may have limited the spread of yaws.

Yaws has not been seen for many years in the east coast region in which the survey took place

TABLE I  
RESULTS OF VDRL TESTS IN GUYANESE ADULTS

Sex	Race	Age Group (yrs)	No. of Tests	Response* Rate (per cent.)	No. Weakly Reactive	No. Reactive			Percentage Weakly Reactive and Reactive	Percentage Reactive
						1:1 and 1:2	1:4 and 1:8	1:16+		
Male	African	35-44	74	69.2	5	2	1	0	10.8	4.1
		45-54	81	66.9	14	5	4	1	29.6	12.3
		Total	155	68.0	19	7	5	1	20.6	8.4
	E. Indian	35-44	103	67.8	5	5	0	2	11.7	6.8
		45-54	97	80.8	12	3	1	0	16.5	4.1
Female	African	35-44	105	71.4	11	6	2	3	21.0	10.5
		45-54	107	73.8	11	3	4	2	18.7	8.4
		Total	212	72.6	22	9	6	5	19.8	9.4
	E. Indian	35-44	104	72.2	13	2	0	1	15.4	2.9
		45-54	103	83.1	16	4	1	0	20.4	4.9
		Total	207	77.2	29	6	1	1	17.9	3.9
	Total		774	73.0	87	30	13	9	18.1	6.9

\*Based on the community population census.

and therefore would not influence the results of the VDRL test. False positive results would be few. None of the subjects had recently been vaccinated against smallpox or typhoid; and malaria, which may also give rise to false positive reactions, was eradicated from this area 20 years ago. One man with leprosy and another with lymphogranuloma venereum were both non-reactive. The majority of the reactive sera were thus likely to have been related to active, latent, or cured syphilitic infection. A reactive VDRL test by itself is, of course, insufficient evidence for a diagnosis of syphilis, but the use of the test in a survey such as this gives a reasonably accurate indication of treponemal infection in the community. A history relevant to venereal disease was not taken and the genitalia were not examined. No signs of cardiovascular syphilis were found. One woman with bilateral optic atrophy and another woman with sensori-neural deafness and other neurological signs, similar to those found in the Jamaican neuropathy syndrome in which a treponemal aetiology has been suspected (Montgomery, Cruickshank, Robertson, and McMenemey, 1964), were sero-negative. No other cases with obvious neurological signs which might have been caused by late syphilis were seen.

The sero-reactivity rate was higher among Guyanese Africans than among East Indians, the difference being increased if weakly reactive results are excluded. Sera reactive in a dilution of 1:4 or greater were found in seventeen Africans (4.6 per cent.) and five East Indians (1.2 per cent.). The difference is probably related to sexual mores, promiscuity being traditionally greater among Africans than among East Indians.

The sero-reactivity rates of the Guyanese of African origin were in the same range as those found by Ashcroft and others (1967) in a survey of

Jamaicans of similar age who had been born and brought up in the city of Kingston where yaws had never been transmitted. The rates were considerably lower than those in a rural Jamaican community where yaws had once been prevalent. In the yaws-free island of Eleuthera in the Bahamas, Florey, Gerassimos, and Cuadrado (1966) reported VDRL reactivity rates (presumably including weakly reactive results) of 25 and 16 per cent. respectively in 63 men and 61 women aged 30 to 60 years, who formed a representative sample of the community. These results resemble those found among subjects of African origin in Guyana, and support the evidence that sero-reactivity is frequent in the West Indies, even in areas free of yaws.

Gonorrhoea is the most commonly occurring venereal disease in Guyana and is treated either by private practitioners or at public health clinics. Table II shows the new cases of sexually transmitted diseases diagnosed in the clinics in 1966 (Nauth Misir, *personal communication*). The predominance of patients of African origin is striking, especially as they do not form the majority of the population; a partial explanation may be that the main clinic lies in Georgetown, where the majority of the people are African; most East Indians live in rural areas.

A feature of interest is the comparatively large number of cases (132) of granuloma inguinale. One of the first descriptions of this condition was that made in Guyana by Conyers and Daniels (1896).

The small number of cases of primary and secondary syphilis (27) seen at the clinics is notable. Willcox (1966) reported that in the United Kingdom the incidence of syphilis in relation to the incidence of gonorrhoea was lower in West Indians than in other immigrants. In 1964, 5.9 per cent. of the total number of reported cases of primary and secondary

TABLE II  
NEW CASES DIAGNOSED AT VENEREAL DISEASE CLINICS IN GUYANA IN 1966

Diagnosis		Total Cases	Race		
			African	East Indian	Other Races
Syphilis	Primary	15	117	18	16
	Secondary	12			
	Latent and tertiary	124			
		151			
Gonorrhoea		2,345	1,731	427	187
Chancroid		22	12	9	1
Granuloma inguinale		132	106	21	5
Lymphogranuloma venereum		7	5	2	0
Non-specific urethritis		63	45	16	2
Trichomonal infestation		388	307	56	25
Moniliasis		129	66	46	17

syphilis in the United Kingdom were diagnosed in West Indian immigrants, 33.3 per cent. in immigrants from elsewhere, and 60.6 per cent. in patients born in Great Britain; comparable percentages for gonorrhoea were 22.5, 27.1, and 50.4 per cent. Primary and secondary syphilis is also less common than might be expected in Jamaica (Ashcroft and others, 1967); in 1965 about 33,000 cases of gonorrhoea were diagnosed in the venereal disease clinics compared with only 242 cases of primary or secondary syphilis. This comparative rarity of early syphilis in the West Indies is unexplained, but may be due to differences in sexual habits or racial susceptibility. Partial immunity from previous yaws infection might also play some part in reducing apparent syphilitic infection among Jamaicans but this would not apply to the Guyanese.

### Summary

VDRL tests were carried out on 774 adults aged 35–54 years in two typical African and East Indian communities in Guyana. Results were weakly reactive in 11.2 per cent. and reactive in 6.9 per cent., the reactivity rate being higher in Africans than in East Indians. Reactivity was not due to previous infection with yaws which has been absent from most of Guyana for many years in contrast to some parts of the West Indies. Clinical evidence of syphilis in Guyana is surprisingly infrequent in view of the high reactivity rates.

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### Les tests VDRL chez deux communautés représentatives d'adultes en Guyane

#### RÉSUMÉ

Les tests VDRL ont été pratiqués chez 774 adultes âgés de 35 à 54 ans de deux communautés typiquement africaine et hindoue en Guyane. Les résultats étaient faiblement positifs chez 11,2 pour cent et positifs chez 6,9 pour cent, le taux des positifs étant plus élevé chez les Africains que chez les Hindous. La positivité n'était pas due à une infection antérieure causée par le pian qui a été absent de la majeure partie de la Guyane depuis bien des années, en contraste à certaines parties des Indes Occidentales. La syphilis clinique en Guyane est d'une rareté surprenante en comparaison avec les taux élevés de positivité.